

REMARKS

In this amendment, claims 4, 10 and 13 are amended, and new claims 19-25 are added. Therefore, claims 4, 6-10, 12-25 are pending and under consideration.

CLAIM REJECTIONS UNDER 35 U.S.C. §§102 and 103

In this Final Office Action, at item 3 on page 2, claims 4, 6-10, 12-18 are rejected under 35 U.S.C. §102(b) as being anticipated by, or in the alternative, under 35 U.S.C. §103(a) as obvious over EP1260498 (EP '498).

At item 3 of the Final Office Action, the Examiner alleges that EP '498 discloses compositions of urea-urethane developers that are "heat treated at 60 degree C or lower." The Examiner further holds that the compositions in the claims of the application "are substantially the same" as those of EP '498 even "without heating in EP '498." Apparently, the Examiner's reasoning is that the specification of the application on page 30 discloses that heating at "above 40 degree C for at least 3 hours" is necessary to produce substantive change in the urea-urethane compositions. The Examiner then argues that, in contrast, the claims of the application include "heating at lower temperatures for any period of time." Furthermore, the Examiner also points out that claims 4, 6, and 7 "do not require any heating." Applicants respectfully disagree with regard to the absence of heat treatment because claim 4 had been amended to include heat treatment "at 40 degree C to 90 degree C" in the Amendment filed on June 25, 2008.

At item 4 of the Final Office Action, the Examiner further asserts that, in the Amendment filed on June 25, 2008, the limitation in claim 4 that is directed to heat treatment is not persuasive. The Examiner contends that the invention is related to a "composition" but the limitation is related to a "process" for treating the dispersion of urea-urethane. The Examiner concludes that, because there is no change in the chemical structure of the urea-urethane composition, the composition taught in EP '498 is the same or similar to that claimed in the application. Applicants respectfully disagree with the Examiner.

Applicants emphasize that the Examiner has apparently overlooked the effect of the heat treatment process or the effect of the component (b) and thus could not appreciate the difference between the products according to the application, and those according to EP '498.

(A) Amended Claims 4 and 10

With this amendment, amended independent claim 4 now recites the following features:

(1) the dispersion of component (a) has been subjected to heat treatment at 40° C to 90° C;

(2) a white portion of a thermal paper formed by using a dye precursor and the dispersion as a developer exhibits a variation of whiteness (ΔW) of 10 or less measured according to the Japanese Industrial Standard Z8722 before and after a humidity test; and/or

(3) a sample of the dispersion containing a dye precursor, a developer and a color inhibitor exhibits a variation of whiteness (ΔW) of 10 or less measured according to the Japanese Industrial Standard Z8722 before and after an acceleration test.

Support for the amendment in amended claim 4 of the application is readily found in the specification, for example, in paragraphs such as: (a) those on page 82, lines 2-20 for the humidity test; (b) those on page 83, line 21 through page 84, line 4 for the acceleration test; and (c) those on page 53, line 6 through page 54, line 15 for the standard measurement of whiteness (ΔW), i.e. the Japanese Industrial Standard (JIS) Z8722.

With this amendment, amended claim 10 now recites that heat treatment is applied after grinding of the dispersion to particle size from 0.1 μ m to 10 μ m. Support for the amendment in amended claim 10 can be found in the specification, for instance, in the paragraph at page 46, lines 1-15.

According to M.P.E.P. §2112.01(l), when "product claims" and "claimed properties" are involved, the court upheld the rejection because applicant had failed to show that the reference "did not possess the functional characteristics of the claims" (Northam Warren Corp. v. D.F. Newfield Co., 7 F. Supp. 773, 22 USPQ 313 (E.D.N.W. 1934)). It follows that if applicant can show that the reference does not possess the functional characteristics in application, rejection should be withdrawn.

Therefore, Applicants would like to point out that the functional characteristics of amended claim 4 of the application, with regard to the humidity test and the acceleration test, are the result of the heat treatment to the dispersion of component (a). Applicants can show that EP '498 does not possess any of these characteristics of amended claim 4 at all.

According to the embodiments of the invention in amended claim 4, heat treatment is a solution to the problems of wet discoloration of a white portion of thermal recording material, and liquid discoloration, without decreasing printing sensitivity. On the one hand, printing sensitivity

may be mainly affected by a reaction of a urea urethane developer at a temperature above the melting point. Liquid discoloration and discoloration of the white portion of the thermal recording material are mainly affected by a reaction resulting from contact between developer particles and dye precursor particles at a room temperature (below the melting point). Therefore, while printing sensitivity may be affected by an intermolecular reaction involving entire molecules under conditions that the molecules flow, in contrast, liquid discoloration and discoloration of the white portion of the thermal recording material depend on a contact reaction of a very small amount of molecules at the surfaces of the particles.

Therefore, while heat treatment may not change the structure of most of the urea-urethane molecules, heat treatment may change at least a mono-molecular layer of the urea-urethane molecules, rendering these molecules on the surfaces of the particles to be chemically unreactive to the dye precursor. Alternatively, such chemical changes may not occur, but physical changes, such as a change of the crystal structure, may occur, leading to the suppression of the reaction. Moreover, the merits of the present application may relate to a dispersion of "particles" where the molecules aggregate. The merits may be less related to a dispersion of "molecules." Therefore, either the physical change, or the chemical change, is considered to provide the merit of the present application. Regardless of how heat treatment works, it results in great improvement of whiteness preservation.

Because amended claim 4 is different from the disclosure in **EP '498**, it is not anticipated by **EP '498**. Therefore, amended claim 4 is novel over **EP '498**.

Also, amended claim 4 of the application is not obvious over **EP '498** because there are no teachings or suggestions in **EP '498** that would have prompted one having ordinary skill in the art to arrive at the embodiment of the invention according to amended claim 4. Without any teaching or suggestion of heat treatment, **EP '498** would not have been obvious to amended claim 4. Therefore, amended claim 4 is patentable over **EP '498**.

Because dependent claims 6-10, 12, 14, 17 and 18 are dependent from amended claim 4, these claims should also be patentable over **EP '498**. Therefore, Applicants request that the rejection of claims 4, 6-10, 12, 14, 17 and 18 under 35 U.S.C. §§102, and 103 should be withdrawn.

(B) Amended Claim 13

With this amendment, amended claim 13, written in an independent form, claims the embodiments related to the use of component (b) for improvements without involving the heat treatment of the dispersion of component (a). Amended claim 13 now recites:

(1) a ratio of component (b) that is more than 1 part and less than 50 parts by mass per 100 parts of component (a);

(2) a white portion of a thermal paper formed by using a dye precursor and the dispersion as a developer exhibits a variation of whiteness (ΔW) of 15 or less measured according to the Japanese Industrial Standard Z8722 before and after a humidity test; and/or

(3) a sample of the dispersion containing a dye precursor, a developer and a color inhibitor exhibits a variation of whiteness (ΔW) of 15 or less measured according to the Japanese Industrial Standard Z8722 before and after an acceleration test.

Support for the humidity test, the acceleration test, and the standard of measuring whiteness have been discussed above. Support for the improvements by using component (b) can be found in Examples 30-41 and Comparative Examples 1-2, which are summarized in Table 2 (Application, pages 79-81). It should be noted that the improvements in whiteness in amended claim 13 is "15 or less," in contrast to the values of "10 or less" in amended claim 4.

Applicants can show that the functional characteristics of amended claim 13, i.e. the whiteness, which can be measured by the humidity test and the acceleration test, are the result of using the ratio of component (b) that is more than 1 part and less than 50 parts by mass per 100 parts of component (a). In addition, Applicants can show that **EP '498** does not possess any of these characteristics at all, and therefore **EP '498** is different from amended claim 13.

It may be that the use of the specifically claimed components and the ratio of component (b) per 100 parts of component (a) may change the environment of the surface particles to become schematically unreactive, thus solving the problems of wet discoloration of a white portion of thermal recording material, and liquid discoloration without decreasing printing sensitivity. Therefore, the merit of color inhibiting is provided by the use of the claimed components and the ratio of component (b) per 100 parts of component (a).

Because amended claim 13 is different from the disclosure in **EP '498**, it is not anticipated by **EP '498**. Therefore, amended claim 13 is novel over **EP '498**.

Also, amended claim 13 of the application is not obvious over EP '498 because there are no teachings or suggestions in EP '498 that would have prompted one having ordinary skill in the art to arrive at the embodiment of invention according to amended claim 13. Without any teaching or suggestion of using such a ratio of component (b) per 100 parts of component (a), EP '498 would not have been obvious to amended claim 13. Therefore, amended claim 13 is patentable over EP '498.

Because dependent claims 15 and 16 are dependent from amended claim 13, these claims should also be patentable over EP '498. Therefore, Applicants request that the rejection of claims 13, 15 and 16 under 35 U.S.C. §§102, and 103 be withdrawn.

(C) New Claims 19-25

In this amendment, new claims 19-25 are added.

Claims 19 and 20 are dependent from amended claim 13. Claim 19 is directed to the heat treatment of component (b), and optionally, to heat treatment of component (a). Claim 20 is directed to heat treatment of component of component (a) after grinding of the dispersion of component (a).

Claim 21 is a method claim directed to dispersing component (a) to form a dispersion, dispersing component (b) at a ratio to component (a), subjecting the dispersion with heat treatment. Claim 21 should be patentable per the discussion above.

Claim 22 is directed to a recording material that is dependent on amended claim 13.

Claim 23 is dependent from claim 22.

Claim 24 is directed to a recording material that is dependent on new claim 21.

Claim 25 is dependent from claim 24.

Because claims 19, 20, 22 and 23 are dependent from amended claim 13, they should also be patentable over EP '498. Applicants requests that new claims 19-21 be allowed.

CONCLUSION

If there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

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